C-M716

Ref. No. 3524

ONKYO® SERVICE MANUAL

COMPACT DISC PLAYER
MODEL C-M716

Black model / Silver model

UP	230V AC, 50Hz
UW	120/220V AC, 50/60Hz

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PARTS NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

ONKYO
AUDIO COMPONENTS

SPECIFICATIONS

Compact Disc Automatic Changer Model C-M716

Signal readout system:	Optical non-contact
Reading rotation:	About 500 - 200 r.p.m. (constant linear velocity)
Linear velocity:	1.2 - 1.4 m/s
Error correction system:	Cross Interleave Reed-Solomon code
D/A converter:	1 bit PWM/ACCUPULSE
Sampling frequency:	352.8 kHz (8 times oversampling)
Number of channels:	2 (stereo)
Frequency response:	5Hz - 20kHz
Total harmonic distortion:	0.005% (at 1kHz)
Dynamic range:	96dB
Signal to noise ratio:	100dB
Channel separation:	90dB (at 1kHz)
Wow and Flutter:	Below threshold of measurability
Output level:	2 volts r.m.s.
Power consumption:	9 watts
Power supply rating:	European and Australian models: AC 230V, 50Hz USA and Canadian models: AC 120V, 60Hz Worldwide model: AC 120V and 220V switchable, 50/60Hz
Dimensions (W × H × D):	275 × 99 × 327 mm (10-7/8" × 3-7/8" × 12-7/8")
Weight:	4.2 kg (9.2 lbs)

Specifications and external appearance are subject to change without notice because of product improvements.

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SERVICE PROCEDURES

1. Safety-check out

After correcting the original service problem,perform the following safety check before releasing the set to the customer:

Connect the insulating-resistance tester between the plug of power supply cord and chassis.

Specifications:More than 10Mohm at 500V.

CAUTION ON REPLACEMENT OF OPTICAL PICKUP

The laser diode in the optical pickup block is so sensitive to static electricity,surge current and etc, that the components are liable to be broken down or its reliability remarkably deteriorated.

During repair,carefulley take the following precautions. (The following precautions are included in the service parts.)

PRECAUTIONS

1.Ground for the work-desk.
Place a conductive sheet such as a sheet of copper (with inpedance lower than 10MΩ) on the work-desk and place the set on the conductive sheet so that the chassis.

2.Grounding for the test equipment and tools.
Test equipments and toolings should be grounded in order that their ground level is the same the ground of the power source.

3.Grounding for the human body.
Be sure to put on a wrist-strap for grounding whose other end is grounded.
Be particularly careful when the workers wear synthetic fiber clothes, or air is dry.

4.Select a soldering iron that permits no leakage and have the tip of the iron well-grounded.

5.Do not check the laser diode terminals with the probe of a circuit tester or oscilloscope.

PROTECTION OF EYES FROM LASER BEAM DURING SERVICING

This set employs a laser. Therefore, be sure to follow carefully the instructions below when servicing.

WARNING!!

WHEN SERVICING, DO NOT APPROACH THE LASER EXIT WITH THE EYE TOO CLOSELY. IN CASE IT IS NECESSARY TO CONFIRM LASER BEAM EMMISION, BE SURE TO OBSERVE FROM A DISTANCE OF MORE THAN 30cm FROM THE SURFACE OF THE OBJECTIVE LENS ON THE OPTICAL PICK-UP BLOCK.

Laser Diode Properties

- Material: GaAlAs
- Wavelength: 760~800nm
- Emission Duration: continuous
- Laser output: max. 0.5mW*

  *This output is the value measured at a distance about 1.8mm from the objective lens surface on the Optical Pick-up Block.

LASER WARNING LABELS

The label shown below are affixed.

1. **Warning lable**
   This label is located on the chassis.

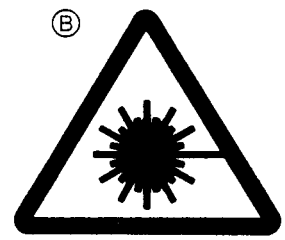
Ⓐ

DANGER —INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCK FAILED OR DEFEATED. AVOID DIRECT EXPOSURE TO BEAM.

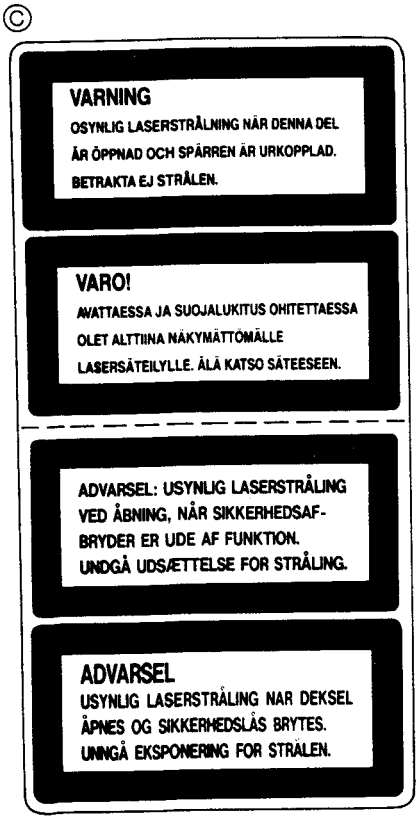
CAUTION —HAZARDOUS LASER AND ELECTROMAGNETIC RADIATION WHEN OPEN AND INTERLOCK DEFEATED.

ATTENTION —RAYONNEMENT LASER ET ELECTROMAGNETIQUE DANGEREUX SI OUVERT AVEC L'ECLENCHEMENT DE SECURITE ANNULE.

Ⓑ

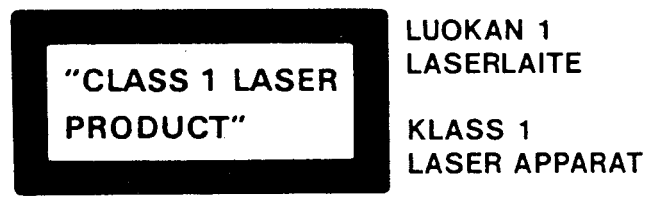


Ⓒ


VARNING
OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.
VARO!
AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.
ADVARSEL: USYNLIG LASERSTRÅLING VED ÅBNING, NÅR SIKKERHEDSAF-BRYDER ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.
ADVARSEL
USYNLIG LASERSTRÅLING NAR DEKSEL ÅPNES OG SIKKERHEDSLÅS BRYTES. UNNGÅ EKSPONERING FOR STRÅLEN.

Ⓐ : Danger label
Ⓒ": Only 230V model except germany model

2. **Class 1 label**
   This label is located on the left side of top cover.



ADVARSEL

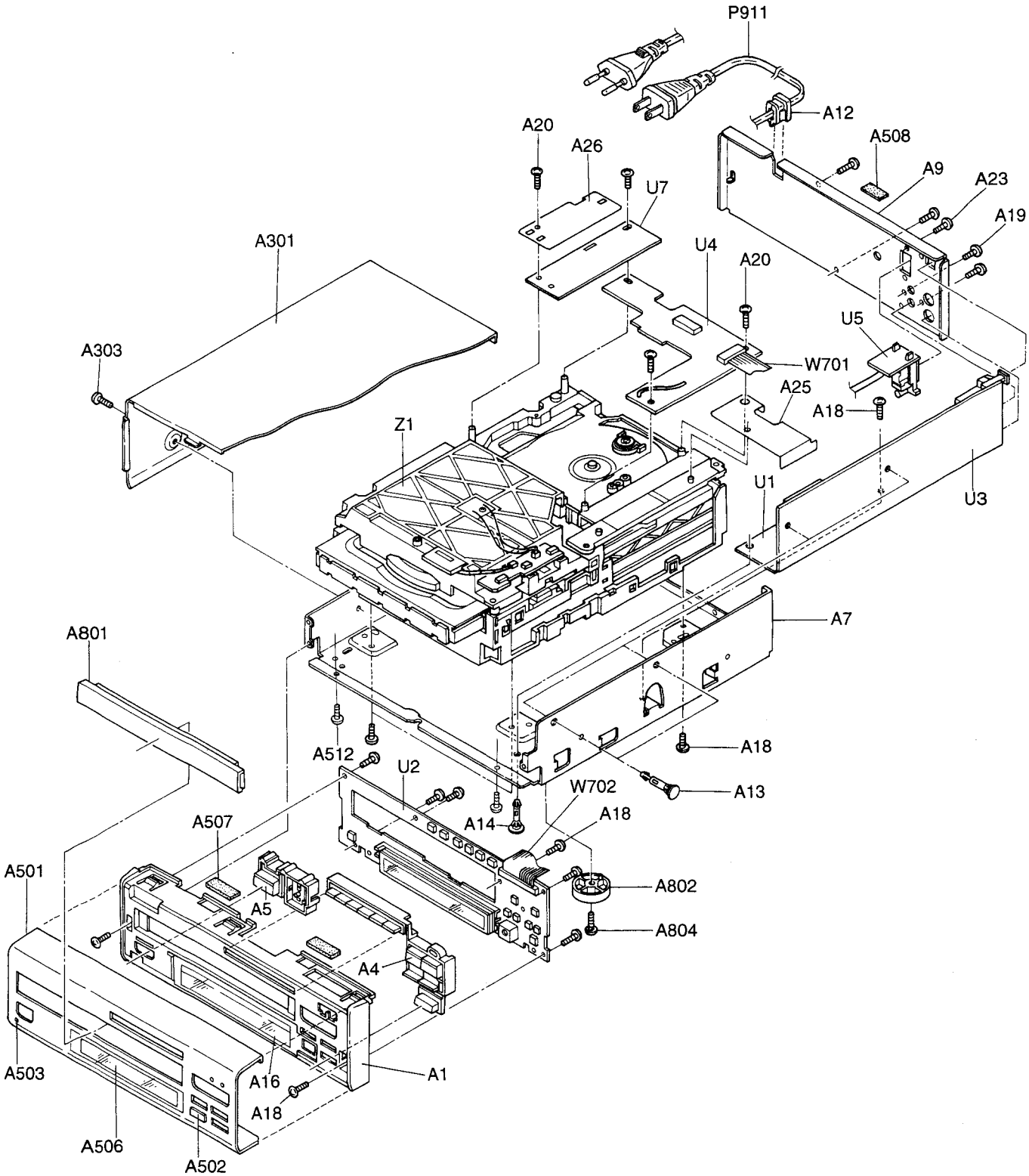
Denna maekning er anbragt på apparatets højre side og indikerer, at apparatet arbejder med laserstråler af klasse 1, hvilket betyder, at der anvendes laserstråler af svageste klasse, og at man ikke på apparatets yderside kan blive udsat for utilladelig kraftig stråling.

APPARATET BØ/R KUN ÅBNES AF FAGFOLK MED SÆRLIGT KENDSKAB TIL APPARATER MED LASERSTRÅLER!

Indvendigt i apparatet er anbragt den her gengivne advarselsmærkning, som advarer imod at foretage sådnne indgreb i apparatet, at man kan komme til at udsaette sig for laserstråling.

VAROITUS! LAITTEEN KÄYTTÄMINEN MUULLA KUIN TÄSSÄ KÄYTTÖOHJEESSA MAINTULLA TAVALLA SAATTAA ALTISTAA KÄYTTÄJÄN TURVALLISUUSLUOKAN 1 YLITTÄVÄLLE NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE.

EXPLODED VIEW



PARTS LIST

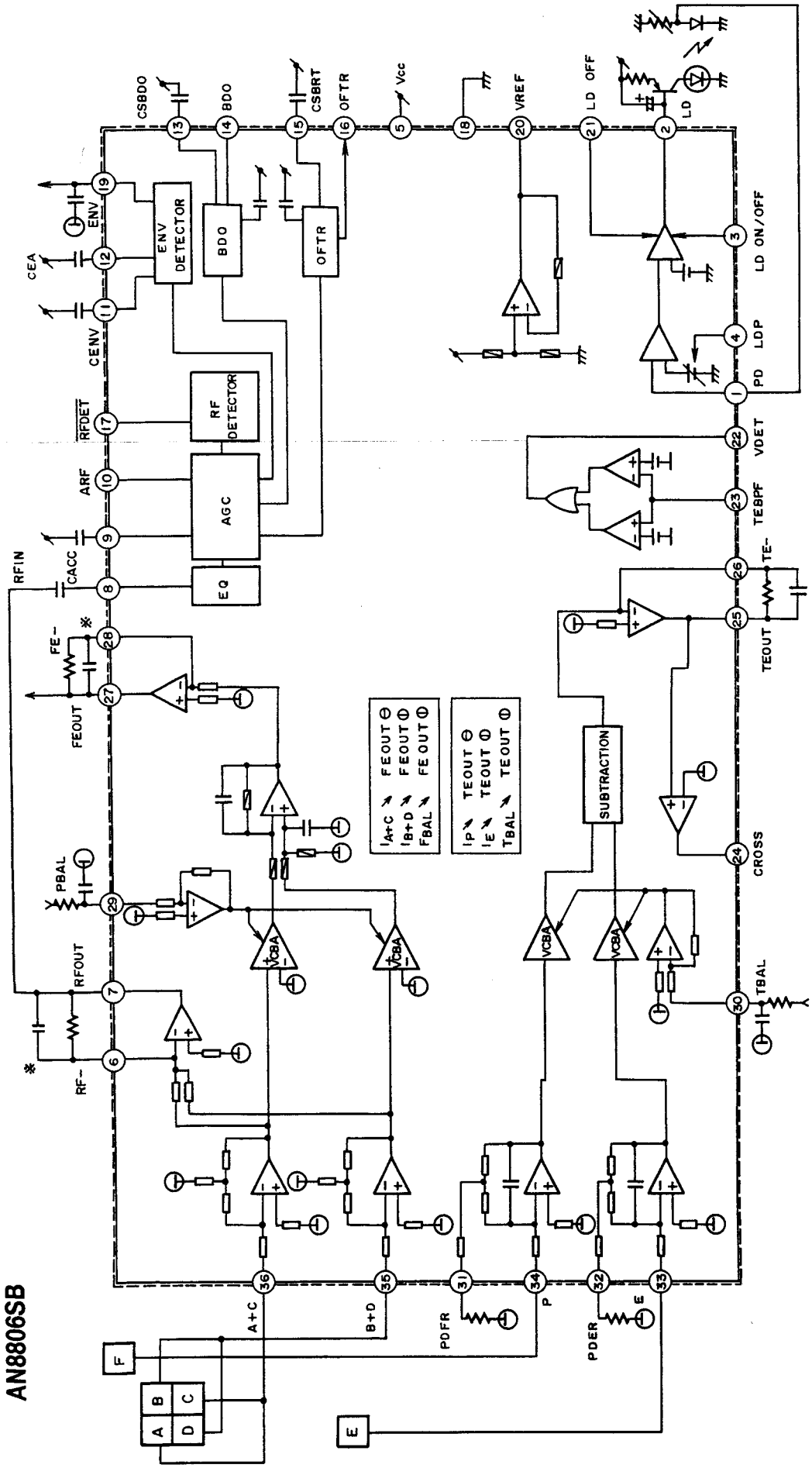
REF.NO.	PART NO.	DESCRIPTION
A1	27110890	FRONT BRACKET <S>
	27110891	FRONT BRACKET <B>
A4	28325191	KNOB(PLAY) <S>
	28325192	KNOB(PLAY) <B>
A5	28324879A	KNOB(POW) <S>
	28324878	KNOB(POW) <B>
A7	27100302	CHASSIS
A9	27122126	REAR PANEL <P>
	27122127	REAR PANEL <W>
A12	⚠ 27300750	CORD BUSHING
A13	27190428A	HOLDER
A14	27190266	HOLDER
A16	28133341	BACK PLATE <S>
	28133342	BACK PLATE <B>
A18	838130088	3TTB+8B, SCREW
A19	838430088	3TTB+8B(BC), SCREW
A20	838426088	2.6TTB+8B, (BC), SCREW
A21	838120080	2TTB+8P, SCREW
A23	838430088	3TTB+8B(BC), SCREW <W>
A24	28175218	ISOLATION PLATE(M)
A25	28175219	ISOLATION PLATE(A) <W>
A26	28175220	ISOLATION PLATE (D)
A301	28184613	TOP COVER <S>
	28184614	TOP COVER <B>
A303	838230088	3TTB+8B(NI), SCREW <S>
	838430088	3TTB+8B(BC), SCREW <B>
A501	27211741	FRONT PANEL <S>
	27211742	FRONT PANEL <B>
A502	28191665A	CLEAR PLATE (RE)
A503	28198797	FACET
A504	28135199Y	BADGE
A506	28191664	CLEAR PLATE
A507	28140555-1	CUSHION
A508	28141284	CUSHION
A510	28141283	CUSHION
A512	838130088	3TTB+8B, SCREW
A801	28148322	D00R AS <S>
	28148324	D00R AS <B>
A802	27175294Y	LEG AS
A804	838130088	3TTB+8B, SCREW
P911	253193HIT	AS-CEE, AC CORD
U1	1H275558-1	NAAF-5558-1, AUDIO CIRCUIT PC BOARD
U2	1H275559-1	NADIS-5559-1, DISPLAY CIRCUIT PC BOARD
U3	1H275560-1	NARF-5560-1, DIGITAL CIRCUIT PC BOARD
U4	1H275563-1	NAETC-5563-1, TERMINAL CIRCUIT PC BOARD
U5	1H275562-1	NASW-5562-1, SWITCH CIRCUIT PC BOARD <W>
U7	1H275564-1	NAETC-5564-1, POWER SUPPLY CIRCUIT PC BOARD
T901	⚠ 2301133	NPT-1251P, POWER TRANSFORMER <P>
	⚠ 2301134	NPT-1251DG, POWER TRANSFORMER <W>
W701	2047161012	NCFC7-161012, FFC
W702	2047321012	NCFC7-321012, FFC
W703	2047173012	NCFC7-173012, FFC
	260208	WIRE TIE
Z1	24800012	NCD-140K-C, CDP M
	29361731A	LABEL(ALL)

<S> : Silver model only
<B> : Black model only
<P> : 230V model only
<W> : World wide model only

NOTE: THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

IC BLOCK DIAGRAM AND DESCRIPTION

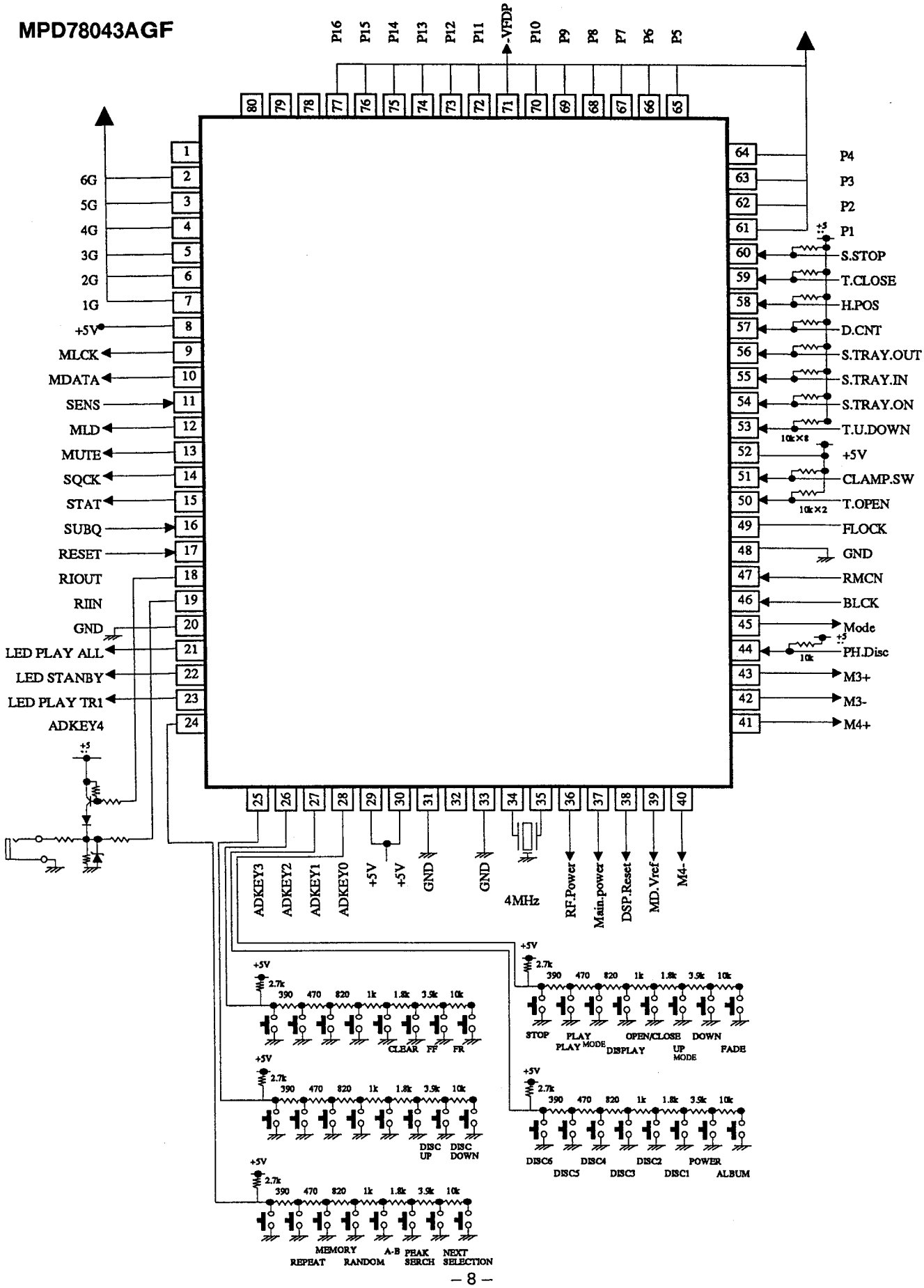
AN8806SB



NO.	I/O	Description
1	I	APC Amp input terminal
2	O	APC Amp output terminal
3	O	APC ON/OFF control terminal
4		APC reference terminal
5		Power terminal
6	I	RF Amp reverse input terminal
7	O	RF Amp output terminal
8	I	AGC input terminal
9		AGC loop filter terminal
10	O	AGC output terminal
11		RF detector terminal
12		HPF-Amp terminal
13		RF dark side envelope detector terminal
14	O	BDO output terminal
15		RF light side envelope detector terminal
16	O	OFTR output terminal
17	O	RFDET output terminal
18		GND
19	O	3TENV output terminal
20	O	VREF output terminal
21	O	APC OFF control terminal
22	O	VDET output terminal
23	I	VDET input terminal
24	O	CROSS output terminal
25	O	TE.Amp output terminal
26	I	TE.Amp reverse input terminal
27	O	FE.Amp output terminal
28	I	FE.Amp reverse input terminal
29	O	F.BAL control terminal
30	O	T.BAL control terminal
31		I-V Amp convert resistor adjustment terminal
32		I-V Amp convert resistor adjustment terminal
33	I	I-V Amp input terminal
34	I	I-V Amp input terminal
35	I	I-V Amp input terminal
36	I	I-V Amp input terminal

MICROPROCESSOR CONNECTION DIAGRAM

MPD78043AGF



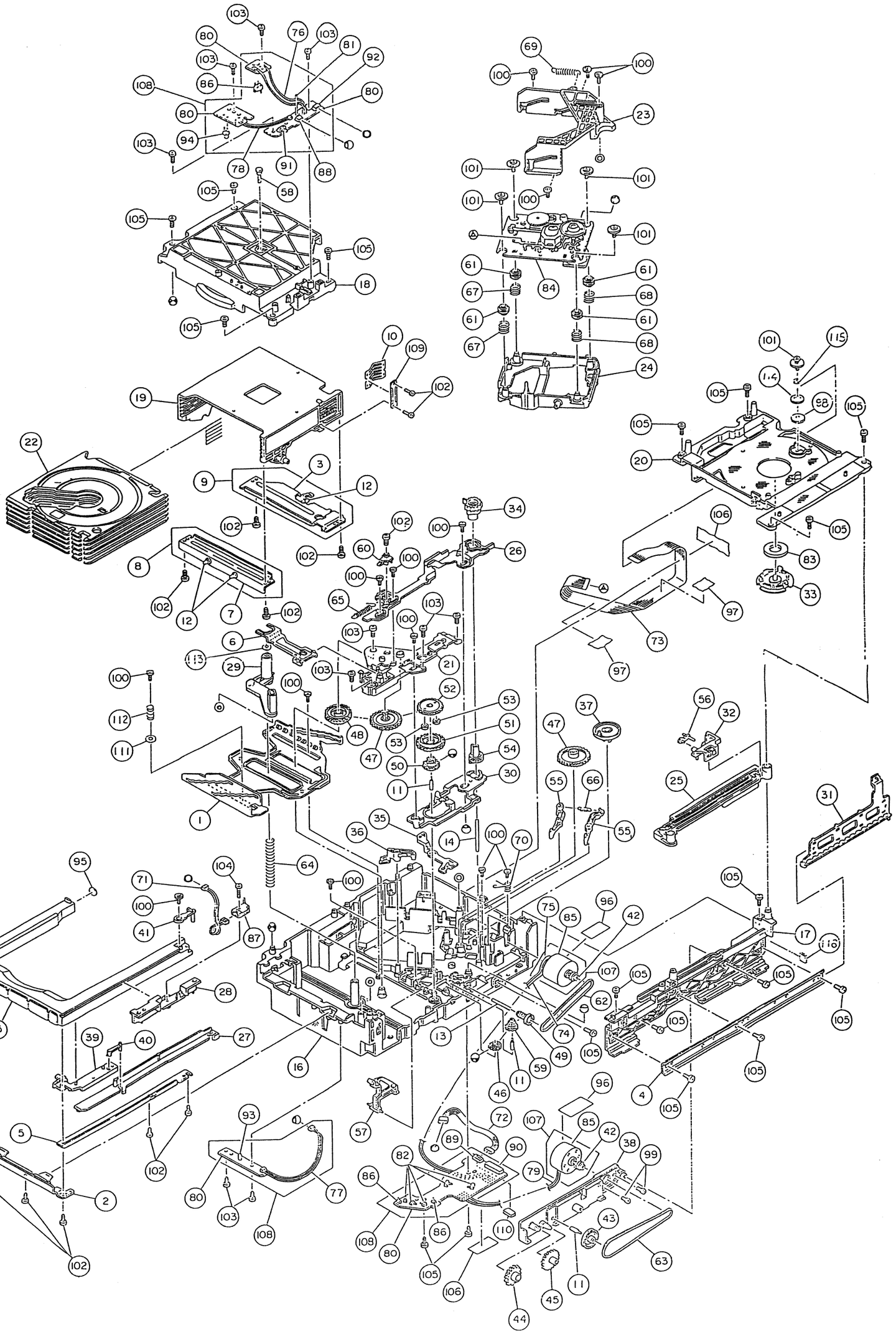
MICROPROCESSOR TERMINAL DESCRIPTION

Pin No.	Symbol	I/O	Description
1			Not used.(Open)
2~7	6G~1G	O	FL tube grid output.
8	+5V	I	
9	MCLK	O	Serial data output of command to signal processor IC.
10	MDATA	O	Serial data input of command to signal processor IC.
11	SENS	I	Sense input from signal processor.
12	MLD	O	Command for signal processor IC. Latch terminal.
13	MUTE	O	Muting ON/OFF control output terminal.
14	SQCK	O	Serial transfer clock of sub code to signal processor IC.
15	STAT	I	Status input terminal from signal processor IC.
16	SUBQ	I	Sub code input terminal from signal processor IC.
17	RESET	I	Reset signal input terminal.
18	RIOUT	O	System signal output terminal.
19	RIIN	I	System signal input terminal.
20	GND	I	A/D converter GND for key input.
21	LED PLAY ALL	O	Play all mode display LED terminal.
22	LED STANDBY	O	Standby indicator LED terminal.
23	LED PLAY TR1	O	Play 1 track mode display LED terminal.
24~28	ADKEY4~0	I	Key input terminal 4~0.
29	+5V	I	A/D converter power terminal for key input.
30	+5V	I	A/D converter reference voltage input terminal for key input.
31	GND	I	Not used.(Conncted to GND)
32			Not used.(Open)
33	GND	I	GND
34	X1	I	Clock circuit input terminal.
35	X2	O	Clock circuit output terminal.
36	RF.POWER	O	Output terminal for RF circuit power control siganl.
37	MAIN.POWER	O	Output terminal for power control signal.
38	DSP.RESET	O	Reset signal output terminal to signal processor IC.
39	MD.VREF	O	Motor driver reference voltage control terminal.(Open)
40	M4-	O	Stocker motor control terminal.
41	M4+	O	
42	M3-	O	Tray motor control terminal.
43	M3+	O	
44	PH.DISC	I	Disc detector photointerrupter input terminal.
45	MODE	I	Mode change over terminal.
46	BLKCK	I	Input terminal of sub code block detector from signal processor IC.
47	RMCN	I	Remote control input terminal
48	GND	I	Microprocessor internaly connect terminal.(connected to GND)
49	FLOCK	I	Focus lock signal input terminal from signal processor IC.
50	T.OPEN	I	Main tray open signal switch input terminal.
51	CLAMP.SW	I	Disc position impropriety detection switch input terminal.
52	+5V	I	Power terminal
53	T.U.DOWN	I	Traverse unit down signal switch input terminal.
54	S.TRAY.ON	I	Subtray detection switch input terminal.
55	S.TRAY.IN	I	Subtray store detection switch input terminal.
56	S.TRAY.OUT	I	Subtray load detection switch input terminal.
57	D.CNT	I	Stocker position count switch input terminal.
58	H.POS	I	Stocker home position detection switch input terminal.
59	T.CLOSE	I	Main tray close signal switch input terminal.
60	S.STOP	I	Pick-up innner position detection switch input terminal.
61~70	P1~P10	O	FL tube segment output terminal.
71	-VFDP	I	Negative power supply terminal for FL tube.
72~77	P11~P16	O	FL tube segment output terminal.
78~80			Not used.(Open)

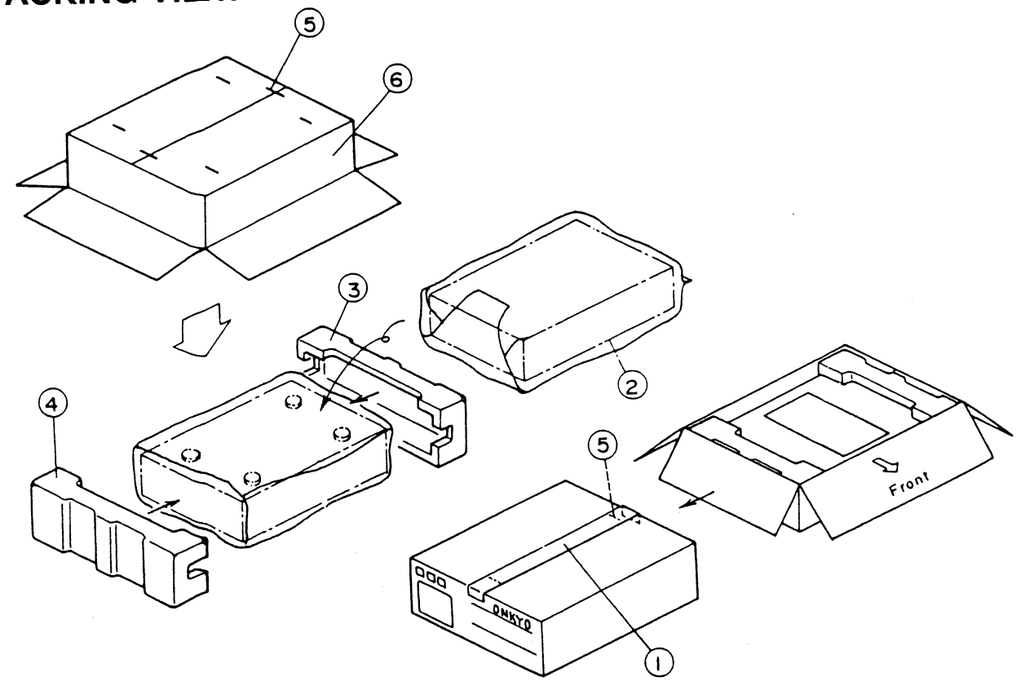
MECHANISM-PART LIST

REF No.	PART No.	DESCRIPTION
1	E1B 1008	SLIDER (LEFT)
2	E1C 1001S	REINFORCING HARDWEAR A
3	E1C 1005S	HOLDER (BOTTOM R)
4	E1C1009S	RAIL (LOADING)
5	E1C 1010S	REINFORCING HARDWEAR B
6	E1D 1002S	LEVER (GUIDE-A)
7	E1D 1003S	HOLDER (BOTTOM-F)
8	E1D 1004	HOLDER ASSY (B-F)
9	E1D 1006	HOLDER ASSY (B-R)
10	E1D 1012	FLAT SPRING (C)
11	E1D 2001	SHAFT (PULLEY)
12	E1D 2002	SHAFT (HOLDER)
13	E1D 2003	SHAFT (WORM)
14	E1D 2004	SHAFT (CAM GEAR)
15	E1A 3001	TRAY (MAIN)
16	E1A 3010	CHASSIS (MAIN)
17	E1A 3012	SUB CHASSIS (RIGHT)
18	E1A 3014	GUIDE (TOP)
19	E1A 3015	HOLDER (TOP)
20	E1A 3033	BRACKET (CLAMP)
21	E1B 3026	BRACKET (GEAR-A)
22	E1B 3027	TRAY (STOCK)
23	E1B 3031	SLIDER (UP/DOWN)
24	E1B 3032	FRAME
25	E1B 3034	RAIL (R)
26	E1B 3042	LEVER (GUIDE-B)
27	E1C 3002	SLIDER (MAIN)
28	E1C 3011	GUIDE (TRAY)
29	E1C 3013	GUIDE (DISC)
30	E1C 3025	RACK (BRAKE)
31	E1C 3028	SLIDER (LOADING)
32	E1C3029	LEVER (LOADING)
33	E1C 3030	CLAMPER
34	E1C 3035	GEAR (TOP)
35	E1C 3039	LEVER (SWITCH LOAD)
36	E1C 3041	LEVER (STOCK SWITCH)
37	E1C 3043	CAM (GEAR)
38	E1C 3044	BRACKET (MOTOR)
39	E1D 3003	SLIDER (CO-TRAY)
40	E1D 3004	LEVER (CO-TRAY)
41	E1D 3005	LEVER (TRAY-A)
42	E1D 3006	PULLEY (MOTOR)
43	E1D 3007	GEAR (PULLEY)
44	E1D 3008	GEAR (FINAL-A)
45	E1D 3009	GEAR (IDLER-C)
46	E1D 3016	GEAR (IDLER-A)
47	E1D 3017	GEAR (IDLER-B)
48	E1D 3018	GEAR (FINAL-B)
49	E1D 3020	WORM (PULLEY)
50	E1D 3021	GEAR (SUN)
51	E1D 3022	GEAR (INTERNAL)
52	E1D 3023	GEAR (CARRIER)
53	E1D 3024	GEAR (PLANET)
54	E1D 3036	GEAR (BOTTOM)
55	E1D 3037	ARM (UP/DOWN)
56	E1D 3038	LEVER (LIMIT)
57	E1D 3040	LEVER (TRAY-B)
58	E1D 3045	ARM (SWITCH)
59	E1D 3046	GEAR (HELICAL)
60	E1D 3047	LEVER (GUIDE-C)
61	C3D 4003S	INSULATOR
62	E1D 4001	BELT (A)
63	E1D 4002	BELT (B)
64	E1D 6001	COMPRESSION SPRING (A)
65	E1D 6002	EXTENSION SPRING (A)
66	E1D 6003	EXTENSION SPRING (B)
67	E1D 6004	COMPRESSION SPRING (B)
68	E1D 6005	COMPRESSION SPRING (C)
69	E1D 6006	EXTENSION SPRING (C)
70	E1D 6007	TORSION SPRING
71	E1D 9002	WIRING HARNESS (2P)
72	E1D 9003	WIRING HARNESS (6P)
73	E1D 9004	FFC (16P)
74	E1D 9005	LEAD WIRE (A)
75	E1D 9006	LEAD WIRE (B)
76	E1D 9007	WIRING HARNESS (JAM)
77	E1D 9008	WIRING HARNESS (PHOTO)
78	E1D 9009	WIRING HARNESS (LED)
79	E1D 9010	WIRING HARNESS (M)
80	E1B 9001	PRINTED WIRING BOARD
81	J11-0098	STYLE PIN
82	S68-0025	PUSH SWITCH SPPB61
83	T99-0544	MAGNET
84	90438002	TRAVERSE UNIT KSM-213BCM
85	T42-0693	MOTOR MMN-6F7LB8JA
86	S40-1140	PUSH SWITCH SPPB51
87	94437095	LEVER SWITCH JSP1220-0201
88	99054008	PH CONNECTOR S2B
89	99054172	CONNECTOR S6B-PH
90	99054174	CONNECTOR 522044-1710
91	99054175	CONNECTOR S5B-PH
92	99437176	CONNECTOR W-7903#11
93	99518074	PHOTO TRANSISTOR
94	99518207	LED SIR-33ST3
95	C3D 8015	SHEET (TRAY-B)
96	E1D 8003	SOFT TAPE
97	E1D 8005	ADHESIVE TAPE (W)
98	E1D 8006	WASHER (SHORT)
99	C3D 8009	SCREW (E)
100	E1D 8001	SCREW (A)
101	E1D 8002	SCREW (B)
102	E1D 8004	SCREW (TRAY)
103	8114512008	BIND TAPPING SCREW 2×8
104	8114512012	BIND TAPPING SCREW 2×12
105	8114512608	BIND TAPPING SCREW 2.6×8
106	96901034	FILAMENT TAPE 19MM×50MM
107	E1D 9012	MOTOR ASSY
108	E1C 9011	P.W.B ASSY
109	E1D 1011	REINFORCING HARDWARE C
110	E1D 8007	CUSHION
111	8233053003	PLAIN WASHER
112	E1D 6008	COMPRESSION SPRING(D)
113	E1D 8008	CUSHION (B)
114	E1D 8009	CUSHION (C)
115	8342123106	POLY WASHER 2.3×5×1t
116	E1D 8010	CUSHION (D)

MECHANISM EXPLODED VIEW



PACKING VIEW



1	29110071	PP TAPE
2	29100037-1Y	650×500, POLY BAG
3	29091707	PAD(R)
4	29091706	PAD(L)
5	282321	STAPLE
6	29052921	CARTON <S>
	29052922	CARTON <B>
	29360687	CLASS 1, LABEL

Accessary bag ass'y

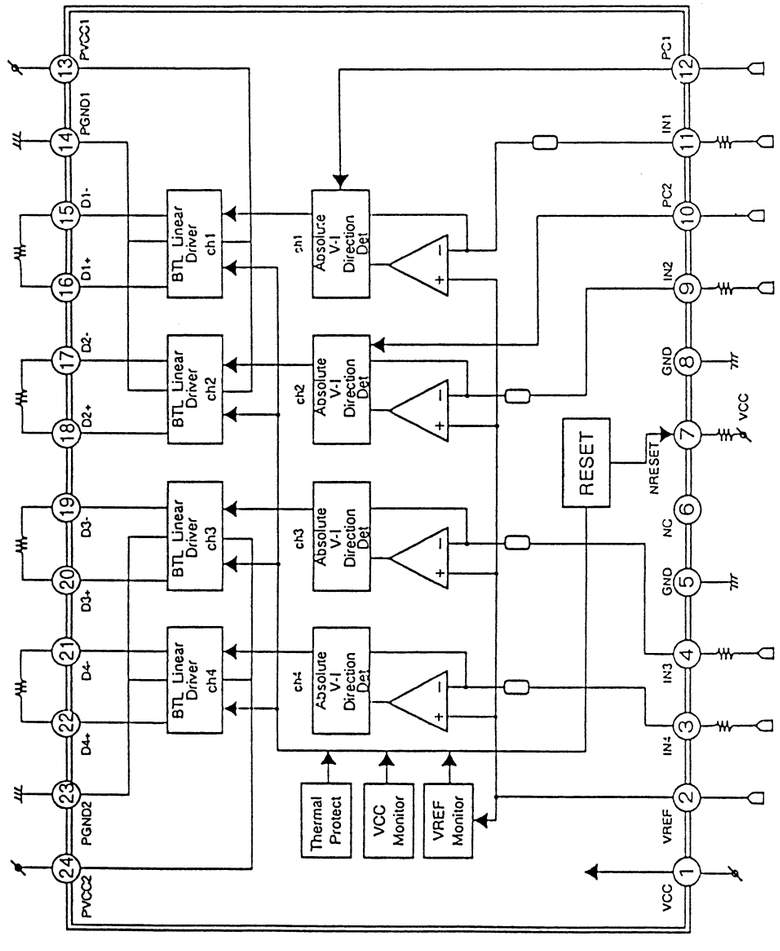
29100097-1Y	350×250, POLY BAG
29342193	INSTRUCTION MANUAL (U6) <P>
29342206	INSTRUCTION MANUAL (U3) <W>
29342192	INSTRUCTION MANUAL (E)
2010098A	PIN CORD
2010200	CORD AS
24140289	RC-289C, REMOTE CONTROL
3010054	UM-3, BATTERY
25055040	CV-K-2, CV-PLUG <W>

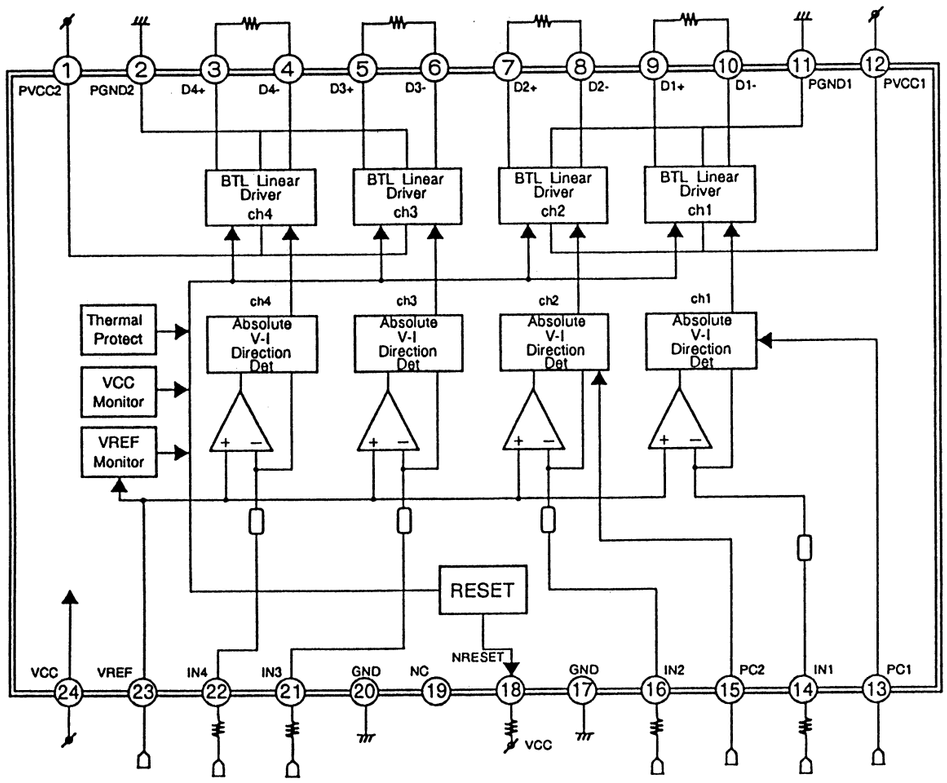
<S> : Silver model only
<B> : Black model only
<P> : 230V model only
<W> : World wide model only

IC BLOCK DIAGRAM AND DESCRIPTION

AN8389S

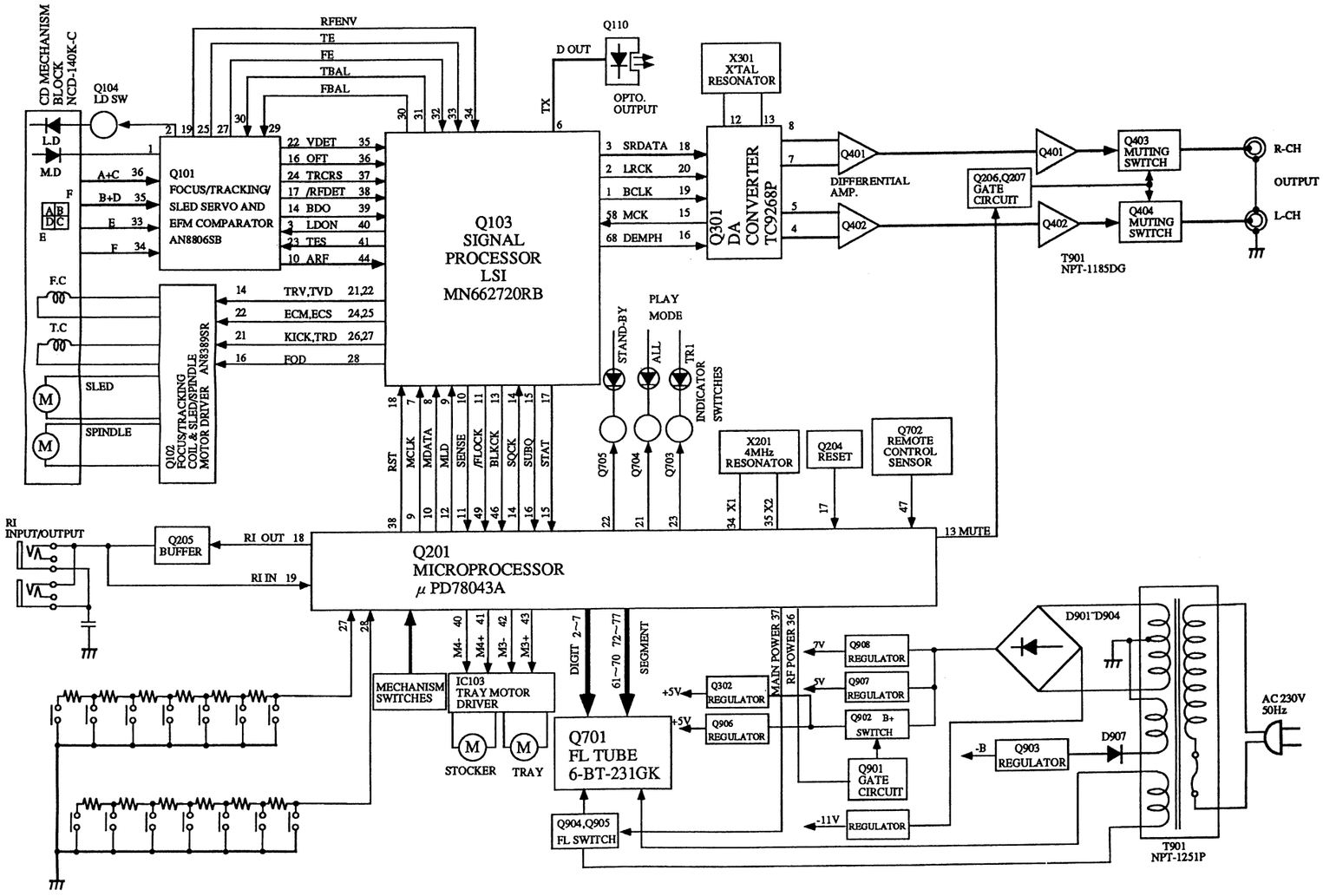
NO.	I/O	Description
1		Power terminal
2	I	VREF input terminal
3	I	Motor driver 4 input terminal
4	I	Motor driver 3 input terminal
5		GND
6		
7	O	Reset output terminal
8		GND
9	I	Motor driver 2 input terminal
10	I	PC2(Power cut) input terminal
11	I	Motor driver 1 input terminal
12	I	PC1(Power cut) input terminal
13		Driver power terminal 1
14		Driver power terminal 1
15	O	Motor driver 1 reverse output terminal
16	O	Motor driver 1 foward output terminal
17	O	Motor driver 2 reverse output terminal
18	O	Motor driver 2 foward output terminal
19	O	Motor driver 3 reverse output terminal
20	O	Motor driver 3 foward output terminal
21	O	Motor driver 4 reverse output terminal
22	O	Motor driver 4 foward output terminal
23		Driver GND terminal 2
24		Driver power terminal 2





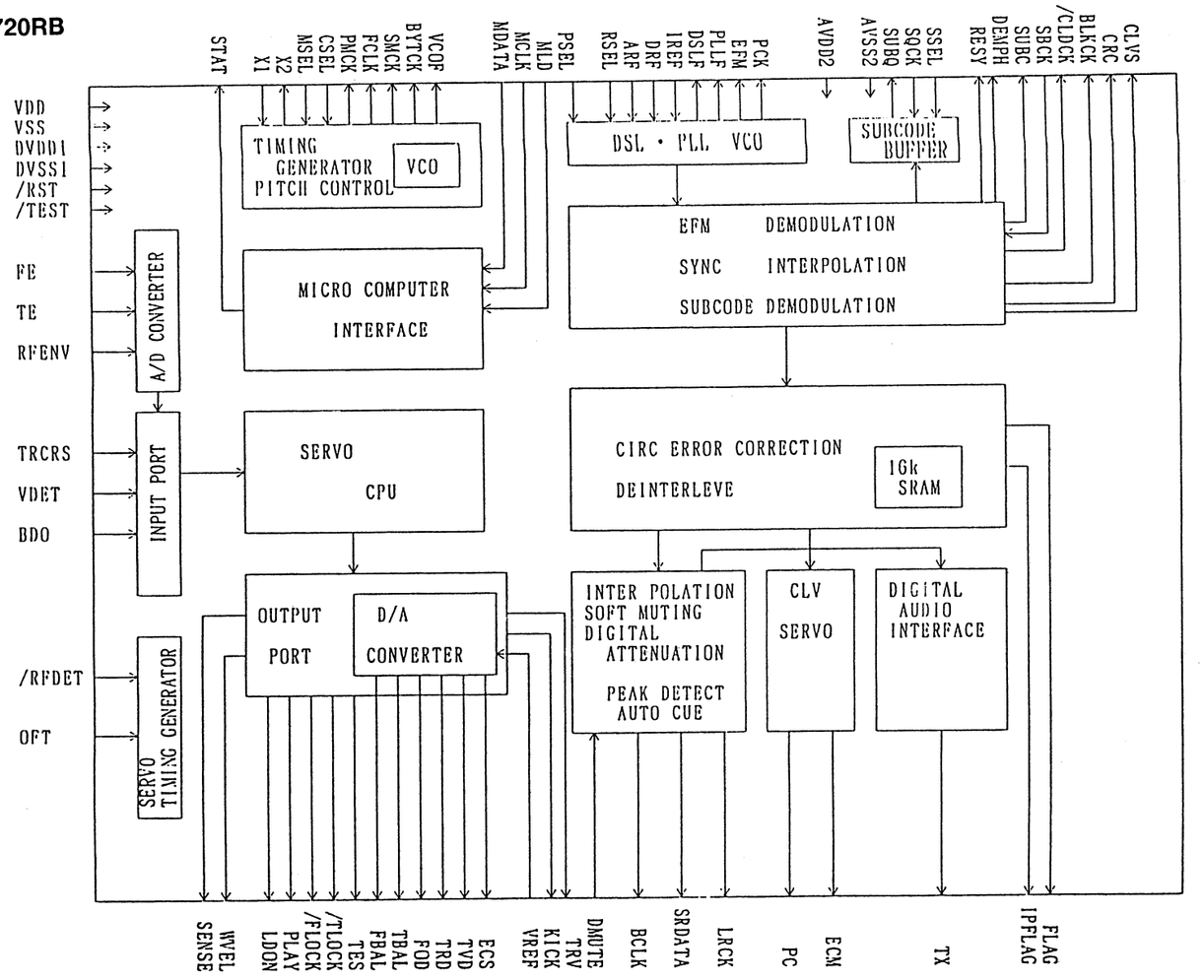
NO.	I/O	Description
1		Driver power terminal 2
2		Driver GND terminal 2
3	O	Motor driver 4 foward output terminal
4	O	Motor driver 4 reverse output terminal
5	O	Motor driver 3 foward output terminal
6	O	Motor driver 3 reverse output terminal
7	O	Motor driver 2 foward output terminal
8	O	Motor driver 2 reverse output terminal
9	O	Motor driver 1 foward output terminal
10	O	Motor driver 1 reverse output terminal
11		Driver power terminal 2
12		Driver power terminal 1
13	I	PC1(Power cut) input terminal
14	I	Motor driver 1 input terminal
15	I	PC2(Power cut) input terminal
16	I	Motor driver 2 input terminal
17		GND
18	O	Reset output terminal
19		
20		GND
21	I	Motor driver 3 input terminal
22	I	Motor driver 4 input terminal
23	I	VREF input terminal
24		Power terminal

BLOCK DIAGRAM



IC BLOCK DIAGRAM AND DESCRIPTION

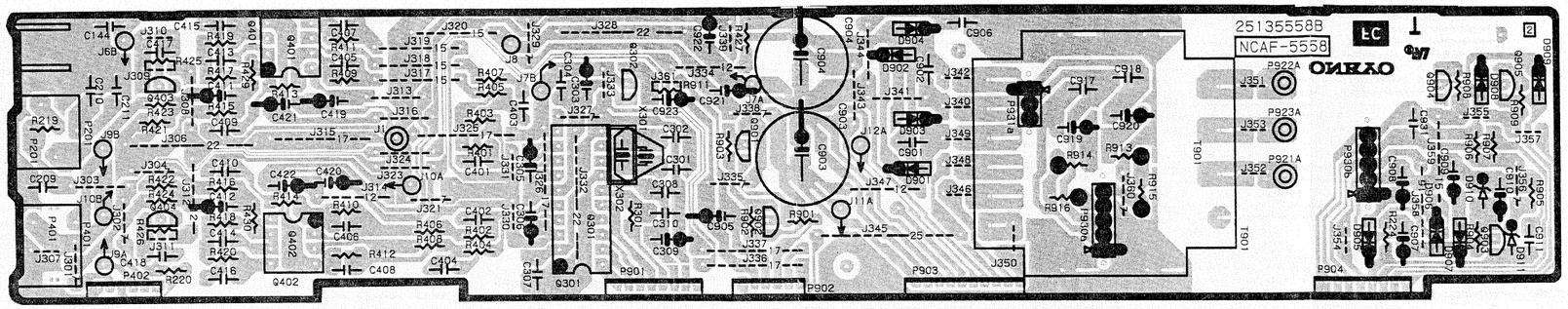
MN662720RB



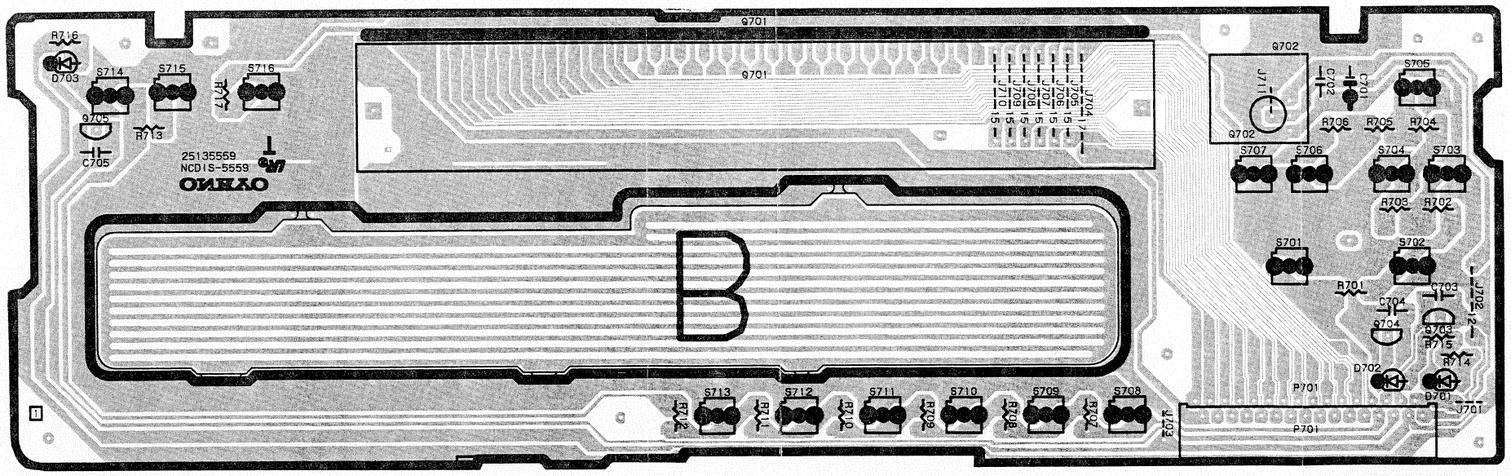
NO.		I/O	Description
1	BCLK	O	Bit clock output for SRDATA
2	LRCK	O	L,R Detection signal output
3	SRDATA	O	Serial data output
4	DVDD1	I	Power for digital circuit
5	DVSS1	I	GND for digital circuit
6	TX	O	Digital audio interface output signal
7	MCLK	I	Microprocessor command clock signal input
8	MDATA	I	Microprocessor command data input
9	MLD	I	Microprocessor command load signal output
10	SENSE	O	Sense signal input
11	/FLOCK	O	Focus servo signal
12	/TLOCK	O	Tracking servo signal
13	BLKCK	O	Sub code block clock signal
14	SQCK	I	External clock input for sub code Q resister
15	SUBQ	O	Sub code Q code output
16	DMUTE	I	Muting input
17	STAT	O	Status signal
18	/RST	I	Reset input
19	SMCK	O	MSEL=H 8.4672MHz clock signal output
			MSEL=L 4.2336MHz clock signal output
20	PMCK	O	88.2kHz clock signal output
21	TRV	O	Traverse enforcement output
22	TVD	O	Traverse drive output
23	PC	O	Spindle motor ON signal
24	ECM	O	Spindle motor drive signal (forcement mode output)
25	ECS	O	Spindle motor drive signal (servo error signal output)
26	KICK	O	Kick pulse output
27	TRD	O	Tracking drive output
28	FOD	O	Focus drive output
29	VREF	I	Reference voltage for DA output
30	FBAL	O	Focus balance adjustment output
31	TBAL	O	Tracking balance adjustment output
32	FE	I	Focus error signal input (analog input)
33	TE	I	Tracking error signal input (analog input)
34	RFENV	I	RF envelope signal input
35	VDET	I	Vibration detection signal input
36	OFT	I	Off track signal input
37	TRCRS	I	Track cross signal input
38	/RFDET	I	RF detection signal input
39	BDO	I	Dropout signal input
40	LDON	O	Laser ON signal output

NO.		I/O	Description
41	TES	O	Tracking error shunt signal input
42	PLAY	O	Play signal output
43	WVEL	O	Hi-speed status signal output
44	ARF	I	RF signal input
45	IREF	I	Reference current input terminal
46	DRF	I	DSL bias terminal
47	DSLF	I/O	DSL roop filter terminal
48	PLLF	I/O	PLL loop filter terminal
49	VCOF	I/O	VCO loop filter terminal
50	AVDD2	I	Power for analog circuit
51	AVSS2	I	GND for analog circuit
52	EFM	O	EFM signal output
53	PCK	O	PLL extraction clock output
54	PDO	O	Phase comparator signals output of EFM signal and PCK signal
55	SUBC	O	Sub code serial output data output
56	SBCK	I	Sub code serial output clock output
57	VSS	I	GND for oscillation circuit
58	X1	I	Crystal oscillation circuit input terminal
59	X2	O	Crystal oscillation circuit output terminal
60	VDD	I	Power for oscillation circuit
61	BYTCK	O	Bite clock output
62	/CLDCK	O	Sub code frame clock signal output
63	FCLK	O	Crystal frame clock output
64	IPFLAG	O	Interpolation flag output
65	FLAG	O	Flag output
66	CLVS	O	Spindle servo phase synchronize signal output
67	CRC	O	Subcode CRC check output
68	DEMPH	O	Deemphasise detection signal output
69	RESY	O	SSEL = L FLAG6 output
			SSEL = H RESY output
70	NC1	NC	No connection terminal
71	/TEST	I	Test terminal
72	AVDD1	I	Power for digital circuit
73	NC2	NC	No connection terminal
74	AVSS1	I	GND for digital circuit
75	NC3	NC	No connection terminal
76	RSEL	I	RF signal pole specified terminal
77	CSEL	I	Crystal oscillation frequency specified terminal
78	PSEL	I	Test terminal
79	MSEL	I	SMCK terminal
80	SSEL	I	SUBQ terminal

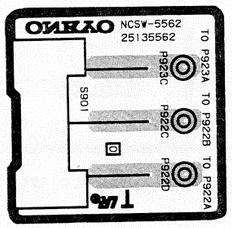
PC BOARD VIEW FROM BOTTOM SIDE



AUDIO CIRCUIT PC BOARD (NAAF-5558-1)

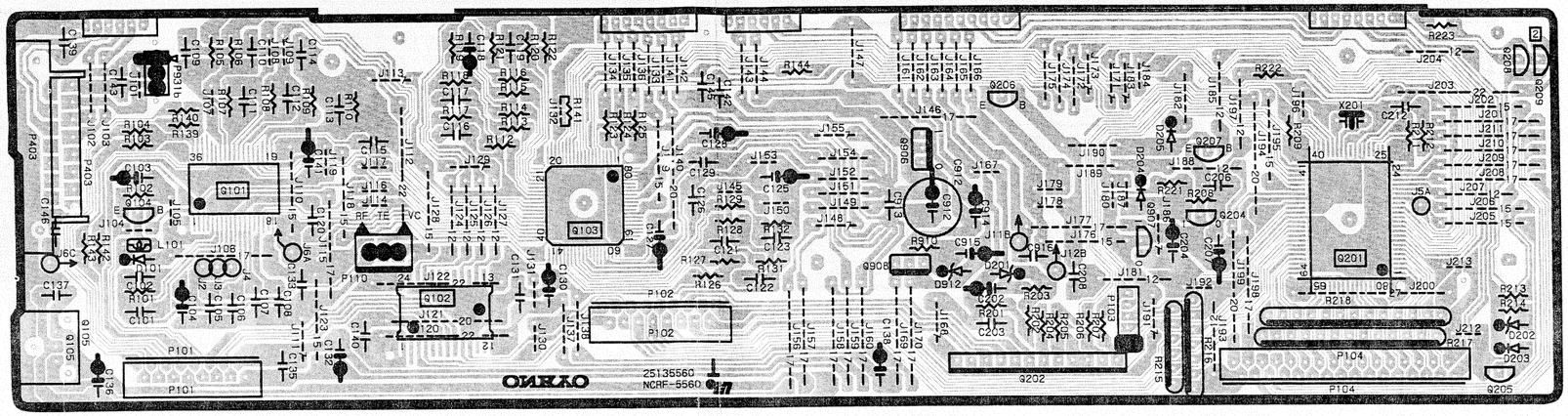


DISPLAY CIRCUIT PC BOARD (NADIS-5559-1)

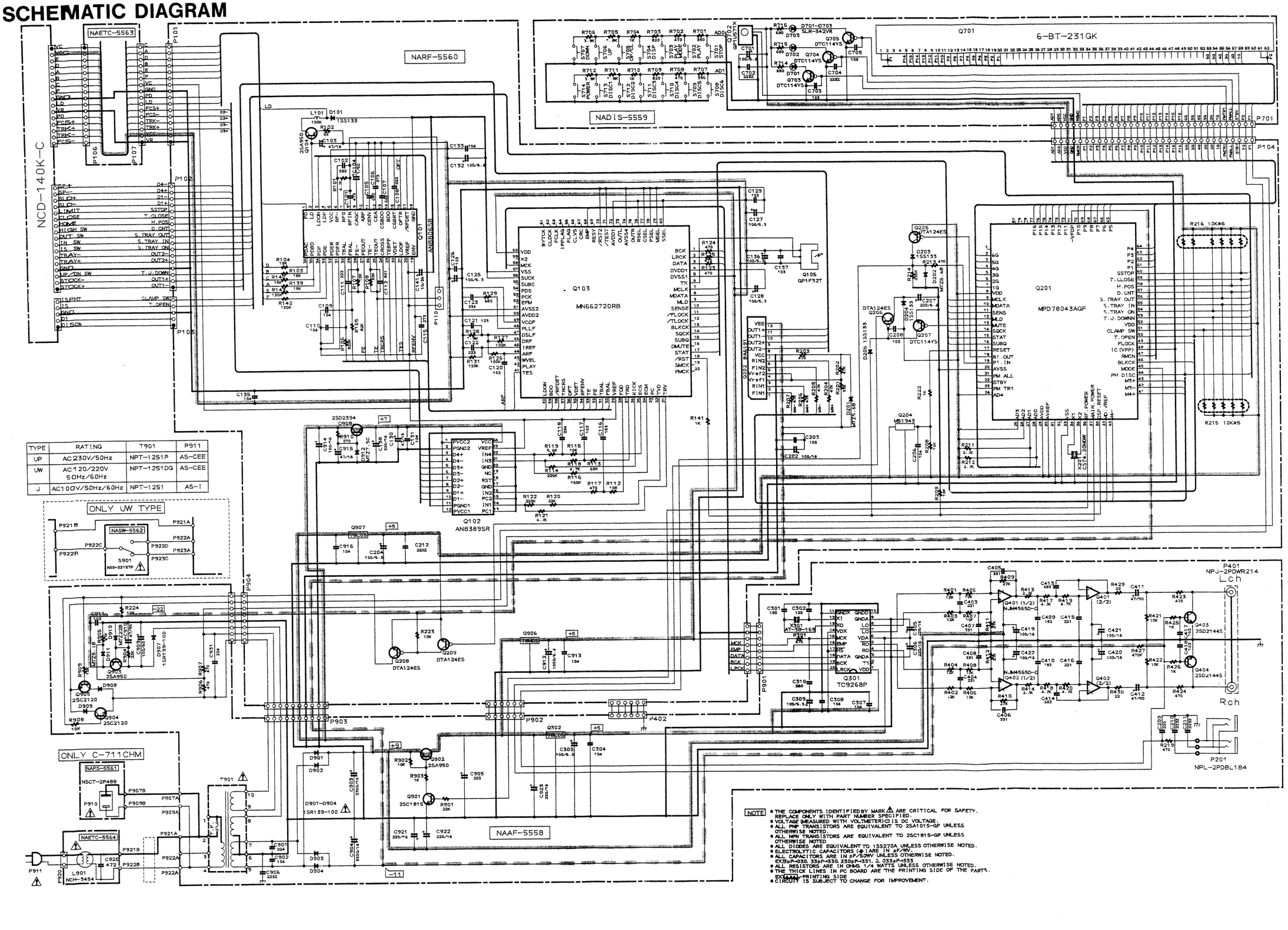


SWITCH CIRCUIT PC BOARD (NASW-5562-1)

PC BOARD VIEW FROM BOTTOM SIDE



SCHEMATIC DIAGRAM



TYPE	RATING	T901	P911
UP	AC230V/50Hz	NPT-1251P	AS-CEE
UW	AC120/220V 50Hz/60Hz	NPT-1251DG	AS-CEE
J	AC100V/50Hz/60Hz	NPT-1251	AS-1

NOTE
- THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.
- VOLTAGE MEASURED WITH VOLTMETER(10MΩ) IS DC VOLTAGE.
- ALL PNP TRANSISTORS ARE EQUIVALENT TO 2SA1015-GP UNLESS OTHERWISE NOTED.
- ALL NPN TRANSISTORS ARE EQUIVALENT TO 2SC1815-GP UNLESS OTHERWISE NOTED.
- ALL DIODES ARE EQUIVALENT TO 1SS270A UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS (◆) ARE IN μF/WV.
- ALL CAPACITORS ARE IN pF/50WV UNLESS OTHERWISE NOTED. EX)5p=0.5p, 33p=330, 330p=331, 0.033μF=333
- ALL RESISTORS ARE IN OHMS 1/4 WATTS UNLESS OTHERWISE NOTED.
- THE THICK LINES IN PC BOARD ARE THE PRINTING SIDE OF THE PARTS. EXCEPT PRINTING SIDE
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

PRINTED CIRCUIT BOARD – PARTS LIST

AUDIO CIRCUIT PC BOARD (NAAF-5558-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICS	
Q301	2224079 2	TC9268P
Q302	2227800 53	78L05
Q401,Q402	2224019 1	NJM4565D-D
	TRANSISTORS	
Q403	2214281	2SD2144S-U
Q404	2214281	2SD2144S-U
Q901	2213284 or	2SC1740S-R or
	2211183 or	2SC1740-R or
	2211255	2SC1815-GR
Q902,Q903	2211504 or	2SA950-Yor
	2211503	2SA950-O
Q904,Q905	2211164	2SC2120-Y
	DIODES	
D901-D904	2238003 5 or	GP104003E or
	2238003 2	1SR139-100
D907-D909	2238003 5 or	GP104003E or
	2238003 2	1SR139-100
D910	2244722 04	MTZJ22D, Zener
D911	2244705 62	MTZJ5.6B, Zener
	RESONATOR	
X301	3010159	AT-38-169
	CAPACITORS	
C403,C404	3733022 14	PP09 125V, 221J, PP C
C405-C408	3733033 14	PP09 125V, 331J, PP C
C409,C410	3747218 24	ECQ-B50V, 182J, TF C
C411,C412	3933847 07	CE04W50V, 47M, VX C
C413,C414	3747268 24	ECQ-B50V, 682J, TF C
C415,C416	3733022 14	PP09 125V, 221J, PP C
C417,C418	3747210 24	ECQ-B50V, 102J, TF C
C419,C420	3933410 17	CE04W16V, 100M, VX C
C421,C422	3933410 17	CE04W16V, 100M, VX C
C901	3747222 44	ECQ-V50V, 224J, TF C
C902	3747210 44	ECQ-V50V, 104J, TF C
C903,C904	3933433 27	CE04W16V, 3300M, VX C
C905	3933422 17	CE04W16V, 220M, VX C
C909	3933810 17	CE04W50V, 100M, VX C
C910	3933647 07	CE04W35V, 47M, VX C
C911	3747210 34	ECQ-B50V, 103J, TF C
C303	3933210 17	CE04W6.3V, 100M, VX C
C304	3747210 44	ECQ-V50V, 104J, TF C
C305,C306	3933222 17	CE04W6.3V, 220M, VX C
C307,C308	3747210 44	ECQ-V50V, 104J, TF C
C309	3933210 17	CE04W6.3V, 100M, VX C
C931	3747222 44	ECQ-V50V, 224J, TF C
C921-C923	3933422 17	CE04W16V, 220M, VX C

CIRCUIT NO.	PART NO.	DESCRIPTION
	TERMINALS	
P201	25045330	NPL-2PDBL184, JACK
P401	25045371	NPJ-2PDWR214, PIN JACK
	PLUGS	
P402,P902	25055506	NPLG-6P481
P901,P904	25055507	NPLG-8P482
P903	25055508	NPLG-10P483
	HOLDER	
	27190751	HOLDER

DISPLAY CIRCUIT PC BOARD (NADIS-5559-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	FL TUBE	
Q701	212146	6-BT-231GK
	REMOTE SENSOR	
Q702	24130007	GP1U571X
	TRANSISTORS	
Q703-Q705	2213570 or	RN1207 or
	221281 or	DTC114YS or
	2214930	UN4214
	DIODES	
D701-D703	225321	SLR-342VR, LED
	CAPACITORS	
C701	355721019	CE04W6.3V, 100M, ELECT C
C703,C705	374721034	ECQ-B50V, 103J, TF C
	SWITHES	
S701-S714	25035652	NPS-111-S604, PUSH SWITCH
	SOCKET	
	25050938	NSCT-32P725, SOCKET
	HOLDER	
	27190929	HOLDER (FL)

DIGITAL CIRCUIT PC BOARD (NARF-5560-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICS	
Q101	22240924	AN8806SB
Q102	22240927	AN8389SR
Q103	22240925	MN662720RB
Q201	22240923 or	MPD78043A or
	22240945	MPD78P044GF
Q202	22240771	BA6191
Q906	222780055M	M5F78M05L
Q907	222780053	78L05

CIRCUIT NO.	PART NO.	DESCRIPTION
	TRANSISTORS	
Q104	2211504 or	2SA950-Y or
	2211503	2SA950-O
Q105	24120038	GP1F32T, OPT MOD
Q203	2212600	DTA124ES
Q204	22240018	M51943A
Q205,Q206	2212600	DTA124ES
Q207	2213570 or	RN1207 or
	221281 or	DTC114YS or
	2214930	UN4214
Q208,Q209	2212600	DTA124ES
Q908	2202706	2SD2394-F
	DIODES	
D101	223222 or	WG713A or
	223205 or	1SS270A or
	223163	1SS133
D201,D202	224470562	MTZJ5.6B, Zener
D203-D205	223222 or	WG713A or
	223205 or	1SS270A or
	223163	1SS133
D912	224470753	MTZJ7.5C, Zener
	COILS	
X201	3010150	CST4.00MGW, CERA LOCK
L101	233454K100	NCH-1452, 100K, CHOKE COIL
	CAPACITORS	
C101	374724734	ECQ-V50V, 473J, TF C
C103	393344707	CE04W16V, 47M, VX C
C104	393380107	CE04W50V, 1M, VX C
C106	374722734	ECQ-V50V, 273J, TF C
C107,C108	374722224	ECQ-B50V, 222J, TF C
C109,C110	374721044	ECQ-V50V, 104J, TF C
C111	374722224	ECQ-B50V, 222J, TF C
C115	374722734	ECQ-V50V, 273J, TF C
C116	374721534	ECQ-B50V, 153J, TF C
C117	374721024	ECQ-B50V, 102J, TF C
C118	374722244	ECQ-V50V, 224J, TF C
C120	374721024	ECQ-B50V, 102J, TF C
C121	374721234	ECQ-B50V, 123J, TF C
C122	374722234	ECQ-B50V, 223J, TF C
C123	374723344	ECQ-V50V, 334J, TF C
C125	393321017	CE04W6.3V, 100M, VX C
C126	374721034	ECQ-B50V, 103J, TF C
C127,C128	393321017	CE04W6.3V, 100M, VX C
C129	374721034	ECQ-B50V, 103J, TF C
C130	393344707	CE04W16V, 47M, VX C
C131	374721044	ECQ-V50V, 104J, TF C
C132	393321017	CE04W6.3V, 100M, VX C
C133	374721044	ECQ-V50V, 104J, TF C
C135	374721044	ECQ-V50V, 104J, TF C
C136	393321017	CE04W6.3V, 100M, VX C
C137	374721034	ECQ-B50V, 103J, TF C
C138	393342217	CE04W16V, 220M, VX C

CIRCUIT NO.	PART NO.	DESCRIPTION
C141	393361007	CE04W35V, 10M, VX C
C202	393341017	CE04W16V, 100M, VX C
C203	374721034	ECQ-B50V, 103J, TF C
C204	393321017	CE04W6.3V, 100M, VX C
C206	374721044	ECQ-V50V, 104J, TF C
C207	393324717	CE04W6.3V, 470M, VX C
C208	374721024	ECQ-B50V, 102J, TF C
C912	393324717	CE04W6.3V, 470M, VX C
C913	374721044	ECQ-V50V, 104J, TF C
C914	393341017	CE04W16V, 100M, VX C
C915	393344707	CE04W16V, 47M, VX C
C916	374721044	ECQ-V50V, 104J, TF C
	RESISTORS	
R215	49121103405	RM1/8GJ, 10K*5, R NET
R216	49121103406	RM1/8GJ, 10K*6, R NET
	SOCKETS	
P101	25050956	NSCT-16P743, SOCKET
P102	25050957	NSCT-17P744, SOCKET
P103	2009990392	NSAS-10P0529, SOCKET AS
P104	25050972	NSCT-32P759, SOCKET
	PLUG	
P110	25055042	NPLG-3P32, PLUG
	CLAMPER	
	27190540-1	CLAMPER

SWITCH CIRCUIT PC BOARD (NASW-5562-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	SWITCH	
S901	⚠ 25065437	NSS-22157P, SLIDE SWITCH

TERMINAL CIRCUIT PC BOARD (NAETC-5563-1)

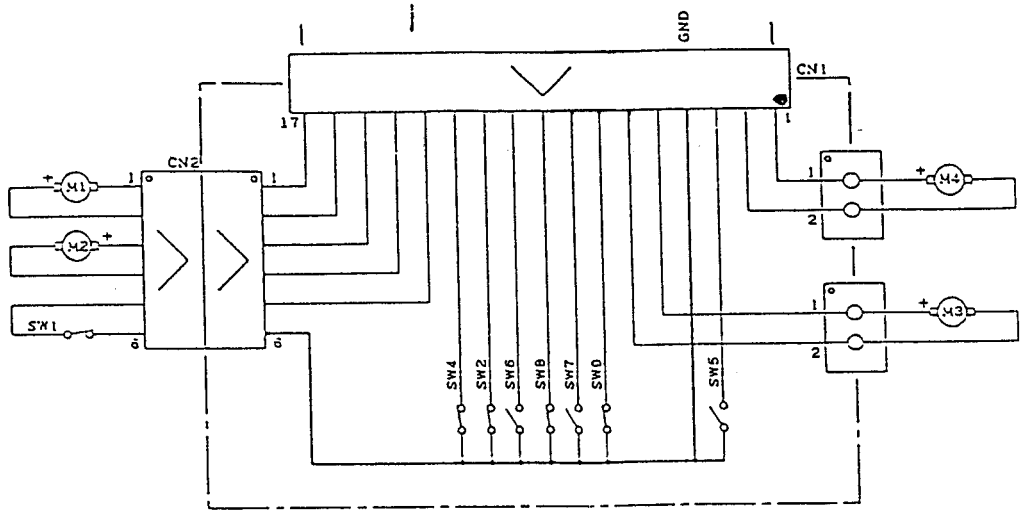
	SOCKET	
P106	25051471	NSCT-16P1258, SOCKET
P107	25050922	NSCT-16P709, SOCKET

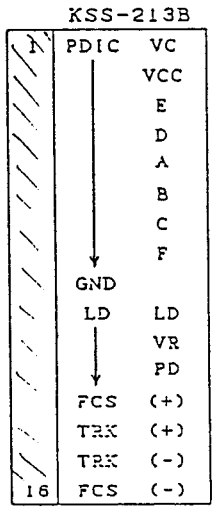
POWER SUPPLY CIRCUIT PC BOARD (NAETC-5564-1)

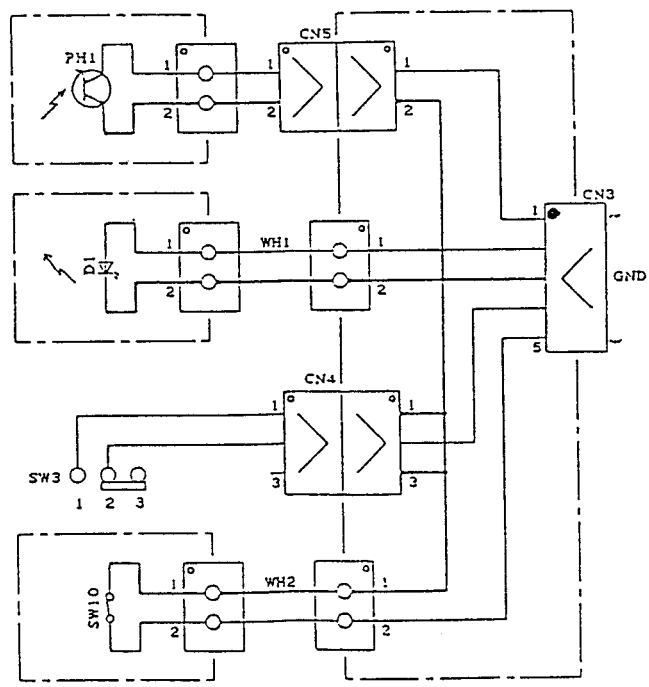
CIRCUIT NO.	PART NO.	DESCRIPTION
	COIL	
L901	231222	NCH-3454, CHOKE COIL
	CAPACITOR	
C925	⚠ 3500077	DE7150F, 472M, IS C
	PLUG	
P920	25055676	NPLG-2P632

NOTE: THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH

SCHEMATIC DIAGRAM







M1	Spindle motor
M2	Sled motor
SW1	Start limit SW
PU	KSS-213B
M3	Tray move&T.U UP/DOWN
M4	Stocker UP/DOWN&sub tray loading
SW2	Home position detection SW
SW3	Tray open detection SW
SW4	Tray close detection & T.U UP detection SW
SW5	T.U DOWN detection SW
SW6	Stocker height detection SW
SW7	Sub tray loading IN detection SW
SW8	Sub tray loading OUT detection SW
SW9	Sub tray detection SW
SW10	DISC insert detection SW
D1	LED (For DISC detection)
PH1	Phototransistor (For DISC detection)

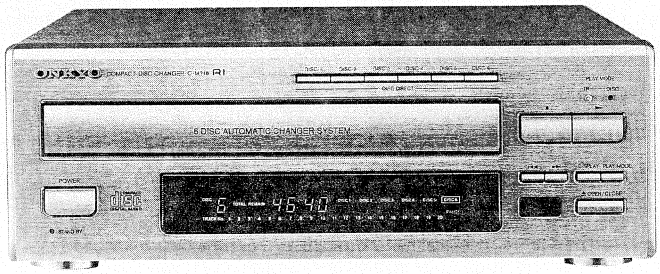
C-M716

Ref. No. 3524-1

ONKYO® SERVICE MANUAL

COMPACT DISC PLAYER

MODEL C-M716



Black model

BMP	230V AC, 50Hz
BMW	120V/220V AC, 50/60Hz

ONKYO
AUDIO COMPONENTS

Disassembly procedures

1. Replacement of optical pick up
   1. Take off the guide(top) and the bracket(clamp), when the flat cable(16P) is connecting to short plug.
   2. Take off the slider(up/down).
   3. Take off the socket(6P/CN2) from the mechanism PCB X25-5660-00 (A/5).
   4. Short the short-land of pick up PCB(8), and take off the flat cable(16P)(12).
   5. Draw out the shaft like Fig.4(10), then take off the pick up and replace it.
   6. Insert the flat cable(16P) and take off the short plug.

Note) Don't take off short plug from frat cable, while pick up replacement and the mechanism assy install to chassis.

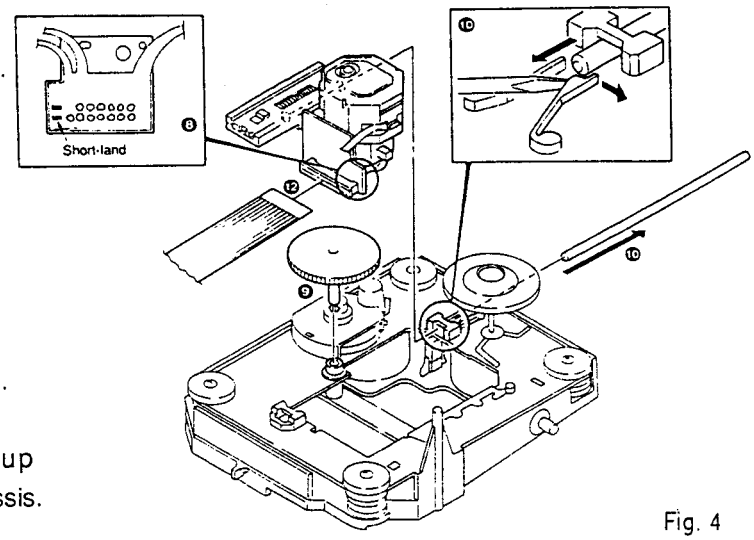


Fig. 4

2. Take off the stocker
   1. Pull the tray and take off it.
   2. Move the gear(top) to position (B), turn the worm(pulley) to front side, and the stocker bring to highest position.
   3. Take off the sub-chassis(R) with motor(M3).
   4. Stretch the hook of slider(lift) to outside like a figure, and draw out the boss of stocker(7). Then draw out the backside boss and take off the stocker.

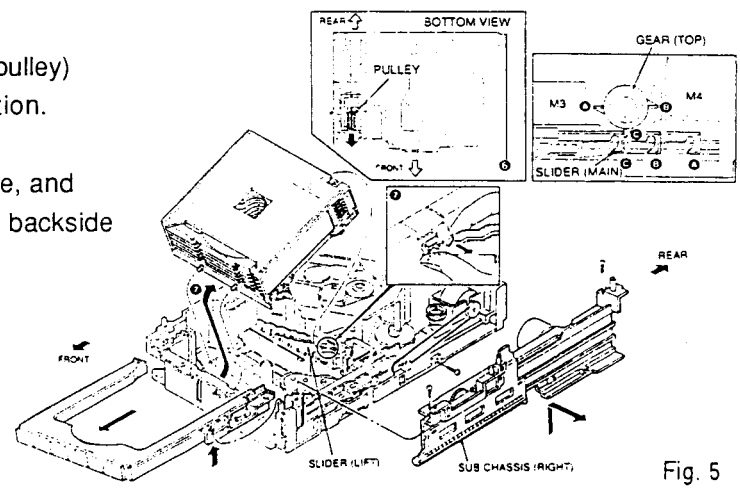


Fig. 5

3. Enforcement tray open
   1. Insert screwdriver from backside of mechanism, and push the slider(main)(Fig6).
   2. Lever(tray A) will unlocked, and push the slider(main). Then the tray bring out easily.

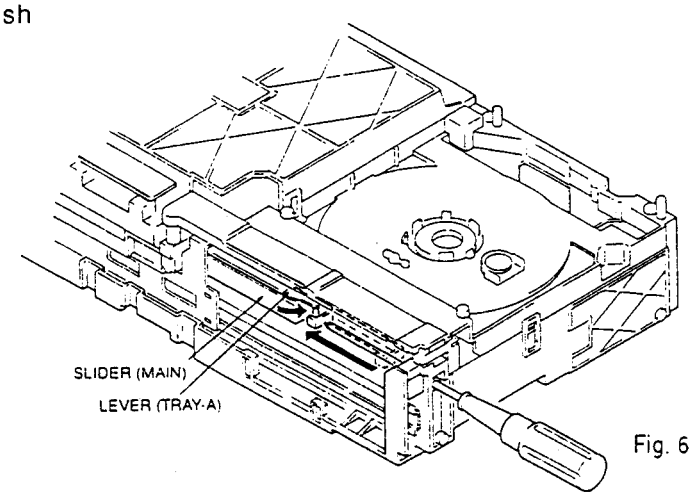


Fig. 6

4. Gear position setting

4-1. Gear(top/bottom) position setting

Boss of stocker : DOWN

MD part : UP

Lever(tray A) : UNLOCKED

1. Put the gap of hole of the lever(guide B) upon the convex of gear(bottom).
2. Put the gear(top) like Fig.7.

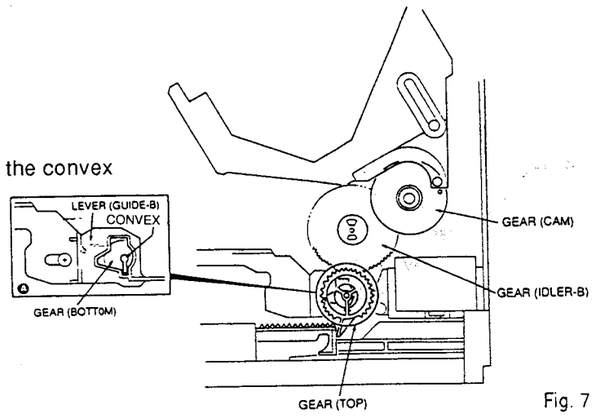


Fig. 7

4-2. Gear(cam) position setting

Boss of stocker : DOWN

MD part : DOWN

Lever(tray A) : LOCKED

1. Put the hole of the gear(cam) upon the hole of chassis(main), and install the gear(cam).
2. Install the slider(UP/DOWN).

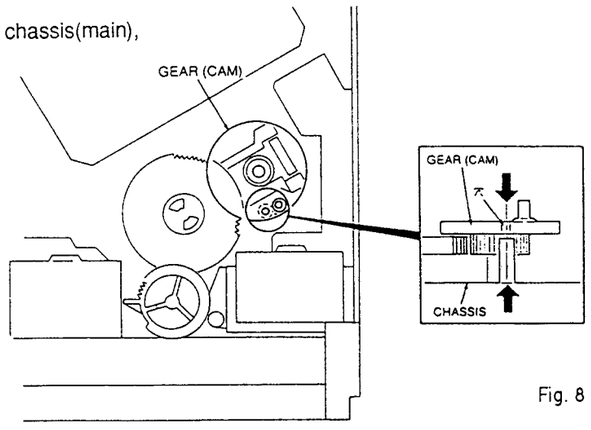
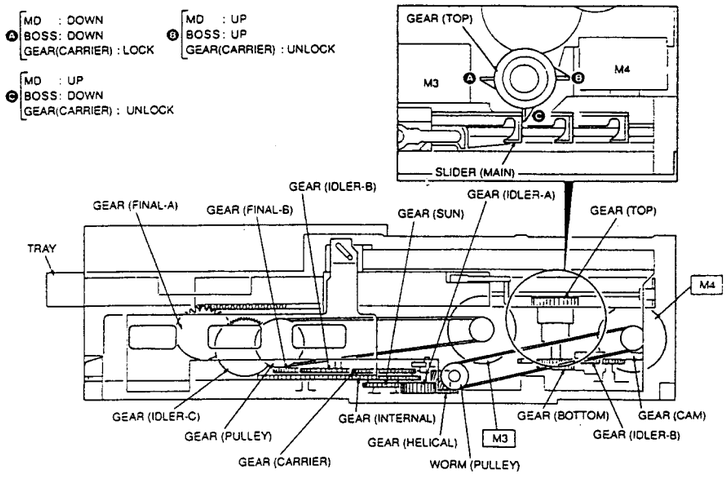


Fig. 8

Descriptions of mechanism work

1. The position and name of gears and motors

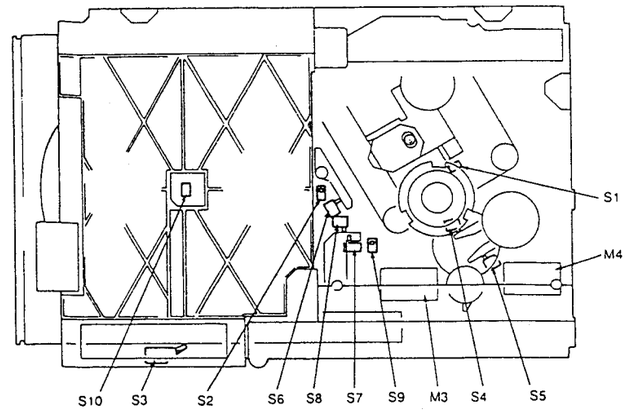


2. The position and work of motors and switches

2-1. Motor

M3 : Slider(main) moving motor
(OPEN/CLOSE•MD UP/MD DOWN)

M4 : Slider(loading) moving motor
(LOAD/STORE•LIFT UP/LIFT DOWN)

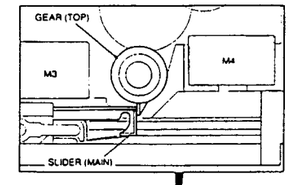


Ref.No.	SW NAME	DESCRIPTION	SW ON : LOW
S1	SLT SW	PICK UP DETECTION SWITCH	PICK UP INNER POSITION
S2	H.POS SW	STOCKER BOTTOM POSITION DETECTION SWITCH	STOCKER BOTTOM POSITION
S3	T.OPEN SW	SLIDER(MAIN) OPEN DETECTION SWITCH	OPEN OK CONDITION
S4	T.CLOSE SW	SLIDER(MAIN) CLOSE DETECTION SWITCH	CLOSE OK CONDITION
S5	T.U.DOWN SW	MECHANISM DECK DOWN POSITION DETECTION SWITCH	MD DOWN OK CONDITION
S6	D.CNT SW	STOCKER HEIGHT COUNT DETECTION SWITCH	OPEN/CLOSE/LOAD/STORE STAND-BY CONDITION
S7	S.TRY IN SW	SLIDER(LOADING) DETECT CARRIAGE LOAD OK POSITION SWITCH	LOAD OK CONDITION
S8	S.TRY OUT SW	SLIDER(LOADING) DETECT CARRIAGE STORE OK POSITION SWITCH	STORE OK CONDITION
S9	S.TRY ON SW	CARRIAGE DETECTION SWITCH	CARRIAGE DETECTION
S10	CLAMP SW	DISC POSITION DETECTION SWITCH	SLLIPING OFF OF DISC CONDITION
	BOSS SW	UP/DOWN DETECTION SWITCH	BOSS UP CONDITION

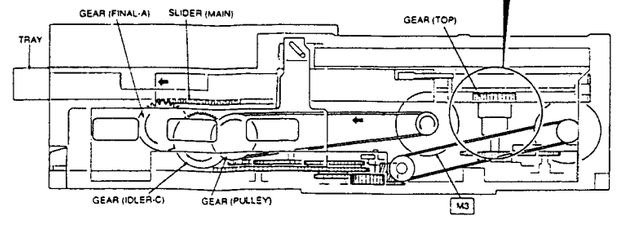
3. The movement of tray OPEN/CLOSE(gear position C)

The movement of tray(OPEN/CLOSE) depends on motor(M3) when the gear(top) placed on position (C).

1. The motor(M3) rotates to anticlockwise, then the gear(pulley) rotates to an arrow side.
2. The gear(pulley) rotates to anticlockwise, then the gear(idler-C) rotates to an arrow side.
3. The gear(idler-C) rotates to clockwise, then the gear(final) rotates to anticlockwise and slider(main) moves to an arrow side. Then the tray moves to OPEN position.

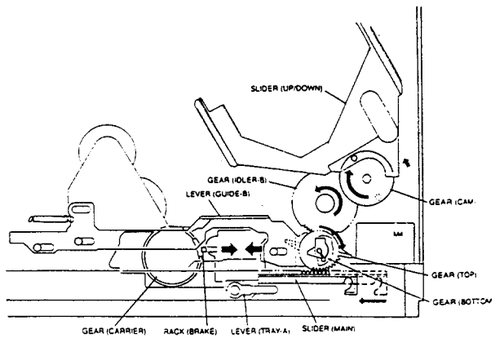


Note) Tray CLOSE movement - the motor(M3) rotates to clockwise.



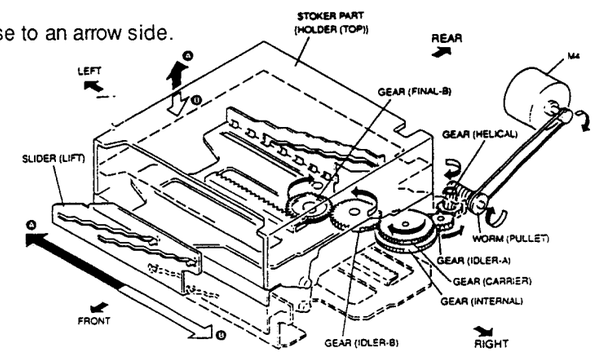
4. The movement of MD part(UP/DOWN)
   The movement of MD part(UP/DOWN) depends on gear rotation of gear(top) position (A)and (B).
   Gear position(A) : MD part DOWN
   Gear position(B) : MD part UP
   1. The motor(M3) rotates to an arrow side like figure, then the slider(main) moves to an arrow side.
   2. The slider(main) moves to an arrow side, then the gear(top) rotates to an arrow side.
   3. The gear(idler-B) rotates to an arrow side, the gear(cam) rotates to an arrow side.
   4. The boss of gear(cam) moves from dotted line to normal line, the slider(UP/DOWN) moves to an arrow side, then MD part moves to UP position.
   5. The gear(bottom) moves to an arrow side, lever(guide-B) moves to an arrow side, then the boss of stocker moves to UP position.
   6. The gear(bottom) moves to an arrow side, the rack(brake) moves to an arrow side, then the carrier will unlocked. So the stocker moves freely.

Note) MD part move to DOWN position - the motor(M3) rotates reverse to an arrow side.



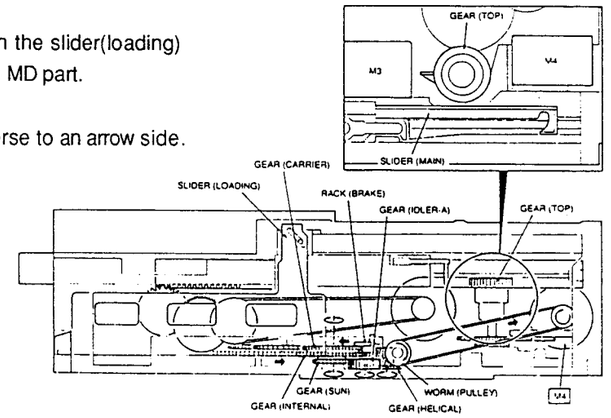
5. The movement of stocker UP/DOWN(gear position B)
   The movement of stocker(OPEN/CLOSE) depends on motor(M4) when the gear(top) placed on position B.
   1. The motor(M4) rotates to an arrow side like figure, then the worm(pulley) rotates to an arrow side.
   2. The worm(pulley) rotates to an arrow side, the gear(helical), the gear(idler-A) and the gear(carrier) rotates an arrow side.
   3. The gear(carrier) rotates to an arrow side, the gear(idler-B) and the gear(final) rotates to an arrow side.
   4. The gear(final) rotates to an arrow side, then the slider(lift) rotates to an arrow side. So stocker moves to an arrow (A) side.

Note) DOWN movement - the motor(M4) rotates reverse to an arrow side.



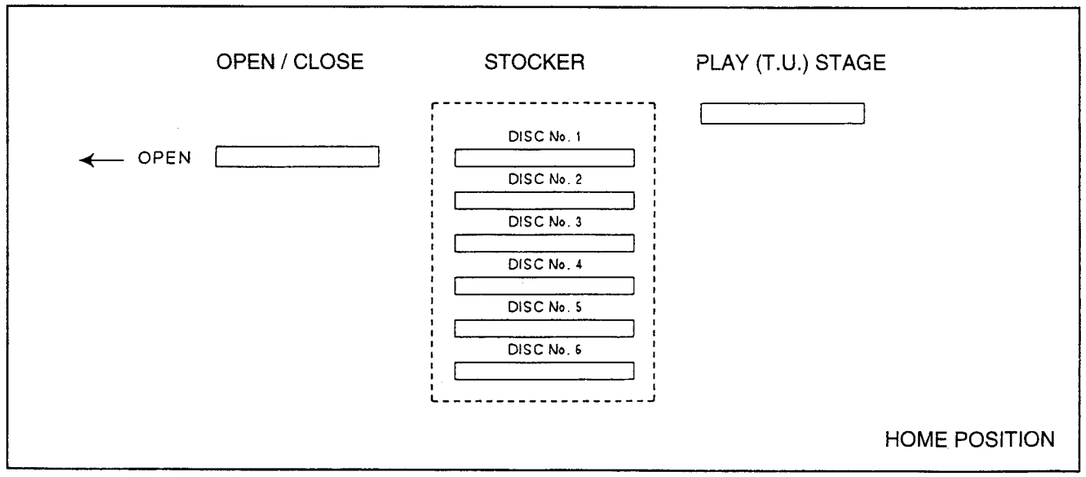
6. The movement of carriage IN/OUT to MD part
   The movement of carriage(IN/OUT to MD part) depends on motor(M4) when the Gear(top) placed on position A.
   1. The motor(M4) rotates to an arrow side like figure, then the worm(pulley) rotates to an arrow side.
   2. The gear(carrier) is locked by the rack(brake) at the position A, so the gear(carrier) can't move.
   3. The gear(carrier) and the gear(internal) are planet gear, so the worm(pulley) rotates to an arrow side then the gear(internal) rotates to an arrow side.
   4. The gear(internal) rotates to an arrow side then the slider(loading) moves to an arrow side, and carriage moves to MD part.

Note) OUT movement - the motor(M4) rotates reverse to an arrow side.



7. The height of OPEN/CLOSE stage and PLAY(T.U.) stage
   The height of OPEN/CLOSE stage is different from the height of PLAY(T.U.) stage. The height of PLAY(T.U.) stage is one step upper than OPEN/CLOSE stage. For example, the disc insert to No.1 position, then the stocker steps one stgae and disc comes to PLAY(T.U.) stage.

Note) The home position - the height of No.1 position is same as OPEN/CLOSE stage.



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